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ROSENGARTEN & SONS.

By William McIntyre.

The manufacturing business of the firm of Rosengarten & Sons was established in 1822. The original partners were Seitler and Zeitler; the former a Swiss from one of the French Cantons, the latter a German from Würzburg.

George D. Rosengarten was at that time engaged in the wool business, and being a competent accountant, and having the confidence of this chemical firm, was engaged to settle the accounts. Being conversant with the French language as well as his native German, he was able to do this to their evident satisfaction.

On December 1, 1823, he became a partner of Carl Zeitler under the firm name of Zeitler & Rosengarten. From this time on nearly all the books of this firm and its various successors are still in a state of preservation, and the history can be followed with some exactness.

Quinine Sulphate, Sulphuric Ether, Spirit of Nitre, Aqua Ammoniæ, Acetic Ether and Hoffman's anodyne were made at this time.

The first sale of Quinine by the firm of Zeitler & Rosengarten was made in December, 1823.

On October 13, 1824, Carl Zeitler withdrew, and the receipt showing that his interest was bought by Geo. D. Rosengarten still exists. From this time the business gradually increased, and later his cousins, Samuel and Hermann Rosengarten were employed.

In 1832 Morphine Sulphate and Acetate were manufactured, the opium being bought from the local wholesale druggists.

Piperine was made in 1833; Mercurials and Strychnine in 1834. Veratrine had considerable sale, and was made in 1835; and Iodide of Lead, Deuto and Protoiodide of Mercury, Iodide of Iron and Iodide of Sulphur; Codeia, Bismuth and Silver salts were made in 1836.

On February 15, 1836, the firm name became Geo. D. & S. Rosengarten, but this only lasted until March 10th of the same year.

In 1835 N. F. H. Denis, a young Frenchman, a pupil of the great chemist Robiquet, was employed as chemist, and on January 1, 1840, became a partner, the name of the firm becoming Rosengarten & Denis, and continued as such until 1853, when Mr. Denis withdrew.

Samuel G. and Mitchell G., sons of G. D. Rosengarten, were then admitted to partnership, and the firm name changed to Rosengarten & Sons.

In 1860 H. B. Rosengarten and Adolph G. were admitted to partnership. The latter enlisted in the 15th Pennsylvania Cavalry (Anderson Troop), rose to the rank of Major U. S. V., and was killed in a cavalry charge at the battle of Murfreesboro, Tenn., on the 29th of December, 1863, on the twenty-fourth anniversary of his birth.

George D. Rosengarten retired from business in 1879, after fifty-six years of active business life. He was a director of the Mechanics Bank for more than fifty years, and of the Pennsylvania Railroad for a number of years; upon his retirement from business he declined re-election to the boards of both of these corporations. He died March 18, 1890, at the age of eighty-nine.

Frank H. Rosengarten was admitted to the firm in 1879. Mitchell G. died in 1898, and Samuel G. and Frank H. Rosengarten retired from the business the same year. The firm was then continued by H. B. Rosengarten and his sons, George D. and Adolph G.

In 1901 the business was incorporated under the laws of the State of Pennsylvania, with the title of Rosengarten & Sons, Incorporated.

H. B. Rosengarten is president, George D. vice-president, and Adolph G. secretary and treasurer, who, together with Joseph G., Jr., and Frederic Rosengarten, constitute the board of directors, all of whom take an active part in the management of the business.

PHARMACY AND CHEMISTRY AT THE WORLD'S FAIR.

By Carl G. Hinrichs, Ph.C.

I.—GENERAL SURVEY.

The Louisiana Purchase Exposition can safely be said to be the largest World's Fair ever held. As to grounds and as to space covered by buildings, it exceeds Chicago and Paris. Exhibitors have spared neither time nor expense to make their exhibits interesting and attractive. Especially in the mining and machinery divisions has an attempt been made to show motion exhibits; thus what would attract the specialist only, becomes of interest to the average sightseer. Processes of various manufactures are shown in actual operation. In the pharmaceutical and chemical arts, however, processes are mainly indicated by the products formed in the successive steps, taken in the course of manufacture to the finished chemical.

If one comes to the Fair with the expectation of finding the chemical and pharmaceutical exhibits collected in the Liberal Arts Building, as the Fair management's classification states, he will be disappointed. Subjects of pharmaceutical interest are to be found everywhere, every building shows some products of the soil or of man's handiwork that are distinctly pharmaceutical.

How closely the leading exhibitors have adhered to the general classifications may be indicated by taking the case of the magnificent display made by the German chemical industry. You would hardly expect to find this display in the Electricity Building. The connection between articles of common chemical manufacture, of technical and analytical furniture, glassware, balances, optical instruments, porcelain goods and the various instruments of precision used by chemists, with electricity, is surprising to the chemists and pharmacists. But if you pass through the exhibit a small case, containing some 200 chemicals made with the current will be found, and here is then the ostensible reason that all of Germany's great chemical industry has been located in this building. Most of these articles the writer was informed can not be made at a profit by electrolysis, still they enabled the Germans to locate in the most prominent building on the grounds, and not in the Liberal Arts way back by the fence.

As pharmacy draws upon the three kingdoms of nature for its first products, and works these up in various ways, we really find

something distinctly pharmaceutical wherever we may turn. This being the case, the writer thought it might be of interest to note those exhibits that are of more than passing interest to the profession, and state where they may be found.

Entering the Mines and Metallurgy Building, the mineral wealth upon which the manufacturer of our chemicals draws is shown. Many exhibits strikingly show the great resources of the several States in certain lines. Pennsylvania has a colliery in miniature working full blast. Alabama's celebrated iron is shown in a colossal statue of Vulcan, whose head touches the roof. Colorado has a small nugget of silver that the Vulcan might use as a watch charm, and from which a paltry $6,000 in silver coin could be made. Minnesota constructed a large geological model of its iron ore beds, together with the method of shipping the mined ore on the iron steamers.

While a great many of the exhibiting States show a certain sameness in their exhibits, such as large blocks of coal, minerals, building stones and oil, others have bestowed much care on the arranging and collecting of their mineral wealth, and of these Colorado undoubtedly leads.

Colorado shows a large circular case filled with native gold in the various forms as found in this State; also several cases of native silver. Especially striking are the cases of finely crystallized ores, gems and minerals found associated with the ores in the gangue. Two cases of uranium ores from Montrose County, one filled with select specimens of pitchblende and the second with carnotite, in which radio-active substances have been found. Rich telluride ores have been sawed in two—one part subjected to roasting, the other not. From the roasted ore, gold in form of drops seems to have exuded from every pore, while the ore proper appears grayish to bluish black and gives no evidence of the riches hidden therein.

On the shores of the Great Salt Lake large quantities of salt are produced by solar evaporation, and some beautiful strings of large cubical salt crystals are seen in Utah's collection. Gypsum usually occurs associated with salt, and some giant crystals, 3 feet in height, probably the largest ever unearthed, are exhibited by Utah, together with some of the celebrated Richardson radium ores.

Near Tiffany's gem exhibit, in which is the remarkable violet-colored gem kunzite, that glows so strongly when exposed to radium

emanations, we found Welsbach's exhibit of rare earths. Here is given ocular proof of the care necessary in defining an element. Didymium has long been considered an element, and you still find didymium salts quoted by large firms. Didymium nitrate is also here shown in a very large jar, and this salt has a fine rose color. Chemists have doubted that this salt contains more than one elemental substance; but, looking at the two products standing beside the large jar, their skepticism is changed to belief. For the Welsbach Company shows a neodymium nitrate differing slightly from the rose-colored mother-salt, and a leaf-green nitrate of neodymium, both having been separated from the so-called didymium nitrate. To say an element "cannot be decomposed" had better be modified to "has not been decomposed," and we will always be nearer the truth.

The bright-red banner of the rising sun is in this building, and everywhere you may go in this Fair it floats. Japan of all the foreign countries has the most complete exhibits next to Germany. It convinces us thoroughly of the great mineral wealth of the tight little islands. Of gold, silver, mercury, copper, iron, lead, coal, sulphur and oil, Japan has abundance. The large stibnite crystals, over a foot in length, are always interesting, for much of the coarser grades of this antimony ore are liquated and sent to St. Louis to be converted into antimony salts. The reader may have often lifted a small portion of the Japanese Empire behind the counter, for this country is the richest in the world in antimony.

Texas is here, and you should not miss the opportunity to take a look at the cinnabar ores of Brewster County, on the Rio Grande. This State will some day be a big producer of mercury; 1,000 pounds of the metal is shown in an iron kettle; a large cannon ball floating on the surface of the mercury convinces the public that mercury has a rather high specific gravity.

Niagara Falls is represented by the various products made by the electric current. Artificial abrasive materials, as crystallized alumina, an artificial emery, with very little diluent, as iron oxide and sand, carborundum, a carbide of silicon, with the various grindstones, hones, etc., made from this artificial substitute for emery. A case of chemicals, such as caustic soda, bleaching powder, potassium chlorate, etc., of very high purity as made by electrolysis, will be of interest to the pharmacist.

Drugs will be found in the Agriculture and Fish, Forestry and Game Buildings.

The German section gives an idea as to how land is reclaimed, the effect of various fertilizers on like soil is shown by the products obtained. Peat and the products obtained by subjecting it to dry distillation are shown, such as acetic acid, methyl alcohol, paraffine, cresol oils and ammonium sulphate.

German East Africa is tropical and abounds in drugs, such as gutta percha, rubber, copal, vanilla, tamarinds, cacao, cocoanuts, sesamé, cashew and betel nuts, archil and annatto, ginger and cinnamon.

Italy evidently intends that it will, if possible, get in on the camphor proposition, for a wall case shows many nicely crystallized samples of camphor as prepared from trees of the Laurus Camphora grown under the direction of the experiment stations.

France has mainly a wine, olive oil, mineral water and chocolate display. The associated colonies, Algiers, Reunion and Bourbon, show drugs. Algiers has evidently a bright future as a cork-producing State; bales of the finest quality are shown. Bourbon has a small case of vanilla, bottles containing the bean are studded with vanillin sublimate and the delicate odor is noticed through the locked case.

The Reunion Botanical Department has a tasty display of spices, benzoin bark used for tanning, and the peculiar jointed roots of the citronella.

Great Britain and Colonies exhibit rubber made from the juices of many spurious rubber plants, products known as "hard Ashanti lump," "soft akim," "salt pond nigger," "white krepi ball," also genuine para biscuit rubber made from the Hevea trees. Nuts, shells and the commercial article, the kernel of the palm nut and the palm oil, are represented.

Japan's breweries make a big show of the celebrated "soy;" this is a sauce much used by the Japanese. The peculiar peppermint oil so rich in menthol, and menthol in crystals of several inches in length are very prominent. Various seed oils, as rape seed; tea, tobacco, pepper, wax and honey, are of importance.

Formosa, Japan's colony, is tropical and grows spices, such as ginger and turmeric. The camphor wood, a large pagoda of pressed camphor, trade packages of camphor and safrol make up the most interesting part of this exhibit.

Ceylon is distinctly an isle of spice. Here are displayed thirty to forty different trade grades of cardamoms, also the seed and wild cardamom pods; cloves, ginger, mace, the natural nutmegs that have neither been limed nor peeled, turmeric, Ceylon cinnamon in bales, cacao, betel nuts, cocoanuts, cinchona bark, etc. The lemon grass and yellow and greenish citronella oils of many native distillers are shown, also cocoanut oil. A hundred grades of tea, and last, but not least, the far-famed delicacy, birds' nests. This exhibit might properly be called a drug merchant's sample house.

Porto Rico has the usual run of tropical produce, such as cacao, ginger (both the white and the yellow), tamarinds, cassia fistula, bay leaves, cocoanuts, rubber and annatto.

Honduras exhibits a large trunk of the rubber tree, rubber, bundles of sarsaparilla, cascarilla, in fact, a whole division devoted to many strange drugs.

Costa Rica displays fibres, woods, barks, fruits. Many bundles of india rubber, with a bottle of the latex, from which the rubber is obtained, make up a separate division. Many drugs, as cinchona, cassia fistula, pepper, ginger rhizomes, untreated and on the point of sprouting. Annato seeds in the bursting pod—imagine a jimpson-weed burr flattened and you have some idea as to the shape of the annatto pod. The seeds are red in color, very angular and somewhat larger than a mustard seed. The annatto paste is also represented.

The Fish, Forestry and Game Building is just north of the Agriculture Building; the dressed woods are most prominent, still the barks, roots, resins, etc., come in for their share of attention.

Egyptian Soudan is the home of gum arabic and all qualities and forms of this drug are shown, also rubber, sesamé and ivory tusks. Most interesting is a sample of common salt made from the saline earth found in the Soudan; the color is grayish white. It comes in forms indicating that in the moist state the salt had been packed in horns.

The Siamese evidently hold drugs of secondary importance; samples of gum benzoin, gamboge, dammar, unpeeled sticklac and india-rubber are placed high up in a dark case.

Ceylon has a trader's case of tanning materials such as myrobalans and cashew nuts, acacia and cinnamon barks, rock alum; also flour made from the sweet potato, plantain, cassava and tapioca. The deadly cobra is shown in the jungle scene.

Japan has a many-sided fish industry, the modes of fishing pursued, the smacks and products, make an interesting exhibit. Several dozen different kinds of fish oils such as herring, cod-liver, sperm, whale and sardine oils are made by the Japs.

Venezuela, among a hundred odd drugs, shows copaiba oil, vanilla, asphalt, copal, kola, cusparia, divi-divi; also the extract, cinchona and simaruba. A peculiar turtle oil that has a buttery consistency and color is among the oddities; a root called "Flamesco" is said to be used in syphilis.

Brazil has a large collection of barks as used in the tanning of leather. The many barks, seeds, etc., used in that country for medicines, and to which not much attention is paid outside of that country, are shown.

Georgia, noted for several centuries as the home of naval stores, has a handsome exhibit in this line. The mode of tapping the pine, the tools used, the big copper stills, worms and containers employed in the turpentine industry are instructive. A hundred trade-brands of resin, resin oils, spirits as used for various purposes are shown.

In the Liberal Arts Building French, English and American chemical manufacturers are represented by elegant exhibits, many of which are characteristic. The production of finely crystallized and consequently very pure compounds is the rule. The industries represent all phases of the chemical technology.

The South Metropolitan Gas Company, of London, S. W., shows the relative amounts of the various products obtained by the fractional distillation of gas tar. Such are benzol, toluol, cresols, naphthalin, anthracene, pitch, etc.

The British Cyanides Company exhibits beautifully crystallized and very transparent prussiate of soda; this salt crystallizes somewhat larger and has a somewhat paler tint than the corresponding potassium salt here also shown.

R. & J. Garroway have an assortment of the sulphates: ferrous, soda, alumina; also large blocks of sal ammoniac are shown.

The tropical cocoanut is worked up by J. Crosfield & Sons, of Warrington, England, select samples of coprah beans, coprah hulls, butter, layers of the press cake sold as cattle food; also the prepared edible butter colored yellow.

Soda and sodium silicate as made by Loewig's process are shown.

The silicate resembles broken glass fragments, having a bright surface and of a greenish to brownish color.

Grove & Co. and Hill & Co. have a case showing sulphur, glycerine and ammonium carbonate. The ammonium carbonate is a very large chunk, and the separate glass receptacle is coated with a fine sublimate.

The Brewer's Supplies are represented by Collet & Co. and Kendall & Sons; these exhibit the sulphites such as the magnesium salt, butyric and valeric acids, the beer color sucrosan, etc.

The United Alkali Works and Bruner, Mond & Co. show the alkali for which they are noted; the celebrated Mond nickel goods are also here.

Cordite explosive in long thin sticks, resembling very dark-colored Ceylon cinnamon, and the various form of shell used with this explosive, make an interesting case. Picric acid is one of the constituents of this terrible explosive.

That England is still on the map so far as the manufacture of artificial dyes from coal tar is concerned, is strikingly shown by the Levinstein Ltd. exhibit. These people have books of colored stuff, showing the value of dyes, also the dyes. A few bottles of Naphthylamine labeled, 4,000,000 pounds annual production, nitronaphthalin, 5,000,000 pounds, and other bottles with similar labels, are shown. As these products are only used as starting materials for the many modern fast dyes, an idea of the vast production is implied.

What will interest the pharmacist the most are the utensils used over a hundred years ago by pharmacists, old oxymel jars, and oil bottles of porcelain, looking more or less like tea-pots or squat wine decanters, quaint iron and bronze mortars, the various helms, retorts and adapters, reminding one of old alchemistic prints, etc. Messrs. Corbyn & Stacey have brought these over.

Perfect alum crystals in large regular octahedræ, as made by Peter Spence & Son, fill two large cases. Thallous, ferric, caesium, chromic, rubidium, sodium and potassium alums in perfect 3-inch crystals are prominent. Isomorphism of the alums is finely demonstrated by growing potassium alum over chrom alum, and vice versa, also iron alum over potassium alum. In Ostwald's "Inorganic Chemistry" it is stated that soda alum does not exist; looking at the fine soda alums shown here, one is convinced of the contrary.

The mineral started with is bauxite; extracting the alumina from this leaves a brownish residue, containing among other substances titanium. The various salts of this commonly regarded rare element are prepared in commercial quantities by this same firm. Twine and yarns mordanted with these salts and then dyed present a peculiarly high gloss, *e.g.*, cotton twine has been so treated.

There are many other manufacturers in this British section, representing the usual run of fine chemicals, but we have not the space to analyze them in this letter.

Research work done at Owens College (now Victoria University) by Professor Schorlemmer on Pennsylvania petroleum many years ago is of historical importance, also the zinc ethyl made by the celebrated Frankland. Most interesting is Sir Henry Roscoe's conclusive work, showing that the then held elemental vanadium was in fact an oxide of this element. The various chlorides and oxides of this element show striking colors; the solutions of the sesquioxide is green, the dioxide is greenish-blue, the tetroxide is deep blue, and the common pentoxide is yellowish. The pentoxide is also shown in large prisms, their color and appearance remind one of permanganate of potassium.

The Wellcome Research Laboratory shows the many beautiful products isolated from plants under Professor Power's direction. The exhibit is very tasty and elegant in appearance. Hundreds of compounds in small watch-glasses and vials show what has been accomplished in the last few years by this enterprising firm of Borroughs, Wellcome & Co. Both Professor Power and Mr. Wellcome were students of the Philadelphia College of Pharmacy, and Americans.

France got here a little late, and as a result is somewhat behind in its installation; but, from what I can see, will have an elegant display of pharmaceuticals and chemicals. Poullenc Frères, of Paris, show finely crystallized samples of potassium iodide, iodoform, sulphates of nickel, etc. Over a pound of metallic lithium in sticks, boron and silicon crystallized, a calcium-aluminium alloy of silvery appearance are among the more uncommon in this exhibit—the only one installed at this writing.

The Mallinckrodt Chemical Works are located near the British chemists, and make a very fine showing. The morphine, ether and cocaine, for which the firm is noted, find prominent places in

the large display of fine chemicals exhibited. The most unique is the group of cocaine crystals, many of which are over 3 inches in length. The firm's initials are done in crystals of terpinhydrate.

In the Electricity Building, as stated, will be found the German chemical exhibit. The Germans have intended to make this an educational exhibit, and commercialism had to take a back seat. The individual firm is not in evidence as in the British section. All firms have pooled their interests, and make a great display where duplication of same subjects is unknown. They have succeeded remarkably well.

The time when chemists worked in the dark cellars and were more or less associated with the Evil One by the ignorant populace, is shown by actual utensils of an alchemist's laboratory as borrowed from the great Nürnberg collection of things alchemistic. In a dark cellar-like grotto, we see the walls and ceiling hung with crocodiles, salamanders, snakes, turtles and the like. Old-fashioned furnaces, with retorts of a peculiar green glass and with helms of the same material, and also adapters and receivers of various forms, show with what these active workers performed the operations of distilling. On the floor are spread ores and gangues as found in Freiberg. Old works of the period are found in the general library of the exhibit.

Opposite the alchemist's laboratory is that of Liebig's at Giessen. Here are the long-armed balances he used, the furnace and bulbs used in combustion analysis that bear his name. The many compounds prepared in the Giessen laboratory during his stay, are arranged along the walls. In looking at the little Liebig had to work with, and contrasting that with what is found in many of the State institutions, it is forcibly brought home that some men may do much with very little, and they that have very much seem to do little.

Synthetic perfumes in pint bottles, such as ionone, rose, etc., an entire case of so-called synthetics, many fine inorganic compounds, thousands of dyes and the various organic compounds of technical or theoretical importance, make up a large part of the exhibit.

Historical work is illustrated by samples of that extremely rare element, Germanium, as separated by the celebrated Freiberg chemist, Clemens Winckler.[1] Also the first contact appliance for

[1] We have almost as fine a sample in our own collection—a present from Winckler.

the preparation of sulphuric acid without the use of the large reaction chambers of the old method is shown by the same chemist. The first indigo as prepared by Baeyer is here as a minute sublimate of blue in a broken test-tube.

Ostwald's appliances, balances of precision, thermometers, gas-measuring burettes, appliances for working with liquefied gases, electric furnaces, Jena glassware, royal porcelain, and in fact almost anything that a chemist might occasionally use in the line of apparatus is shown.

Haereus shows his molten quartz apparatus. Small tubes, retorts, crucibles, flasks of thin quartz are blown by glassblowers, the only difference being that with glass a smoother finish is obtained than with quartz. These quartz goods may be heated to a white heat and plunged into cold water without cracking.

Goldschmidt's thermite has a separate case. Thermite is a mixture of the metallic aluminum in powder with an oxide of a metal, say iron; on causing a sudden ignition of the mass by a spark from the so-called Zündkirsche, iron free from carbon is produced in the molten state, while alumina is the product of combustion. Many metals as uranium, tungsten, chromium, that are with difficulty produced by other operations, are readily produced in like manner, in a molten state, and in large quantities.

THE NEW MEDICAL LABORATORIES OF THE UNIVERSITY OF PENNSYLVANIA.

The ceremonies connected with the dedication of the new laboratories of pathology, physiology and pharmacology of the University of Pennsylvania, on June 10th, were not only of great general interest, but the event was one of the most important in the history of the University, and has a direct bearing upon the practice of medicine and pharmacy in America.

"The last quarter of the nineteenth century witnessed the conversion of the teaching and practice of medicine from a theoretical to a practical and demonstrative basis. This momentous change, than which nothing more revolutionary and beneficent has been achieved in the history of the intellectual development of the race, has been the result of the establishment of laboratories in which research in medical science might be conducted. By means of the facilities

offered in these laboratories, workers have not only enormously increased our knowledge of the structure and functions of the human body, and of the nature of disease, but have also provided methods which have already robbed some of the most direful pestilences of their chief terrors. Hitherto America has scarcely kept pace with foreign countries in provision for scientific study in medicine and in incentives to its prosecution. While this aspect of medical education has not been wholly disregarded in this country, the limitations placed upon institutions of learning by their inability

The New Medical Laboratories of the University of Pennsylvania.

to provide adequately out of their means for the support of laboratories has had a detrimental effect upon the growth of American medicine. In other countries the national and municipal governments have done what in this country is left to the accident of private inclination and beneficence.

"In view of these contingencies, the University of Pennsylvania has constructed a new medical laboratory which was formally dedicated on June 10, 1904. In completeness of equipment this new building is without a rival. It provides for the teaching of students and the carrying on of research work on physiology, pathology and phar-

macology, in which departments of medicine the greatest advances have been made in the past, and may be predicted for the future.

"The opening of these laboratories is not simply of local but of national interest. The construction of the building has occupied about four years, and has cost, exclusive of its ground and equipment, in the neighborhood of $700,000. The erection of a new medical hall, an anatomical building and auxiliary buildings, adjoining the building dedicated, is also contemplated in the near future. These with the present hospitals and clinical laboratories will form one of the most extensive systems of buildings devoted to the teaching of medicine in Europe or America.

"The new building is quadrangular in shape. It is located on the south side of Hamilton Walk, between Thirty-sixth and Thirty-seventh Streets, on the site of the old Veterinary Hall and Hospital. The building is two stories in height above a high basement, and measures 337 feet in front by nearly 200 feet in depth. The long front faces north, securing a maximum amount of the best light for laboratory purposes. Along the front are arranged small rooms for research, offices for professors and assistants and similar purposes. These open into private corridors, so that those employed in these rooms may pursue their work without interruption from those passing through the main halls.

"Perfect lighting of all the laboratories has been obtained, the size of the courts and the height of the front building insuring good north light to the laboratories of pharmacy and pharmacodynamics on the first floor, and to the large laboratories on the second floor devoted to pathology, where microscopic work is to be done—the north front of these rooms, facing on the courtyard, being almost wholly of glass and extending higher than the front, so that steady north light will be thrown to the back of the room.

"The basement rooms are also well lighted. Here will be located locker, recreation and toilet-rooms for the students, janitor's quarters, rooms for practical instruction in physical diagnosis and bandaging, rooms for sub-section teaching in physiology, storerooms, research-rooms, etc.

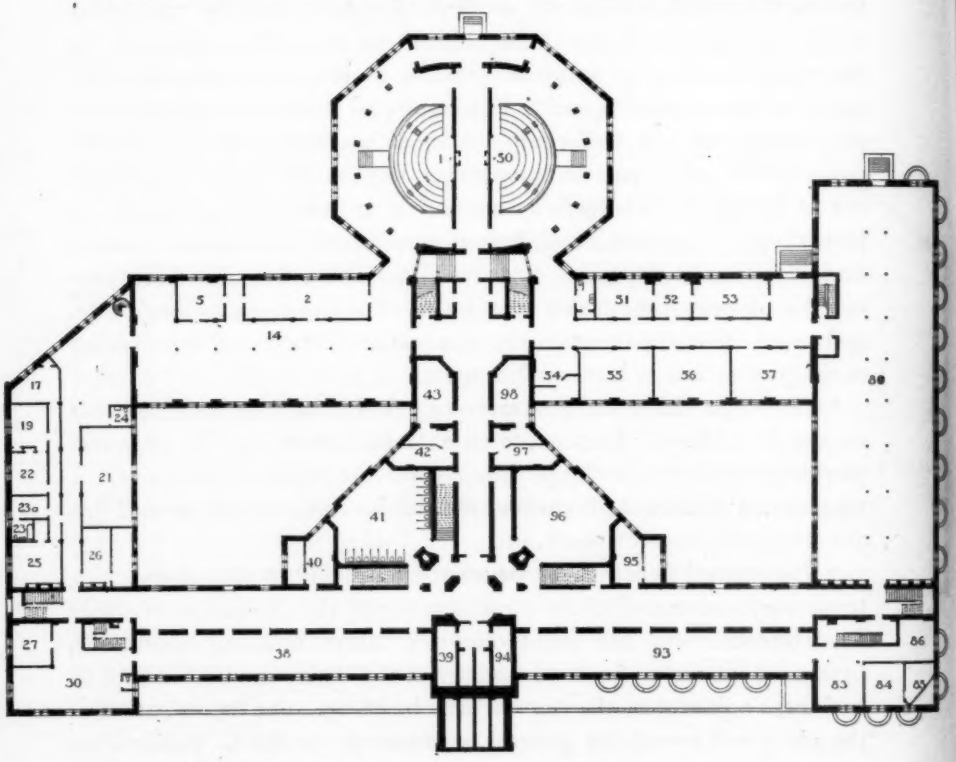
"The first floor of the new laboratories is to be devoted to physiology and pharmacodynamics. The department of physiology on the first floor will have provided one large room, in which there will be ninety cabinets fully equipped with such apparatus as is required

in the practical exercises in physiology carried on by the students. Three rooms have been especially constructed and equipped for aseptic operations on the lower animals, one of them being a preparation room for the operators, another a preparation room for the animals and another for operating. These will be equipped with the most modern appliances, so that operations may be carried on under the most favorable conditions known to modern surgery. In the north front are a number of small rooms which have been set apart for the instructor and his assistants for instruction in advanced physiology, etc. A well-equipped shop has been provided for the construction and repair of apparatus. In the east wing are a number of rooms for sub-section instruction in special departments in physiology—digestion, circulation, respiration, calorimetry, nerve-muscle, special senses, etc., respectively. There has also been provided a photographic dark-room and an adjoining room for projection and other optic apparatus of the greatest importance in the making of diagrams, charts, lantern slides, etc.

"The department of pharmacology has also been provided for on the first floor. This contains a large laboratory for practical pharmacodynamics, a large laboratory for practical pharmacy, a museum, a library and various rooms for the instructor and his assistants for research work, etc.

"The second floor will be devoted exclusively to pathology, with temporary accommodations for a number of the professors of other departments until the completion of future building operations, rendering possible the final transfer of the entire medical school to buildings adjacent to the present new building. An examination of the plans will reveal the general purposes of the floor. Aside from the provisions for lecture-rooms, the chief purpose of the plan of operation and construction looks to laboratory instruction. The entire north front of the building (with the exception of the temporarily arranged private rooms for various professors and the general pathological office) is devoted to laboratories for advanced students in experimental pathology and pathological bacteriology and the special research and assistants' rooms. The east wing accommodates the laboratory of advanced pathological histology and a seminar and journal room; the west wing is occupied by the pathological museum, the gross morbid anatomy demonstration room, a room for museum preparation, photographic rooms and rooms for

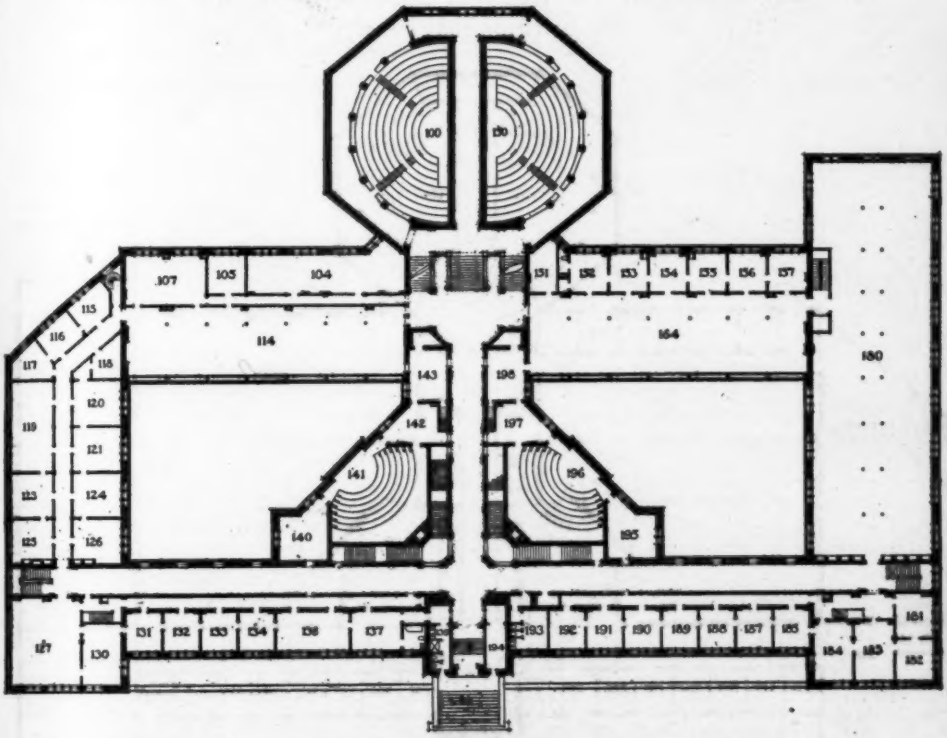
animal operations. The museum and gross morbid anatomy demonstration rooms are in close proximity to the large class laboratory of pathological histology in the west end of the southern part of the building with the important aim of closely relating the instruction carried on in each. This last laboratory, that of pathological his-



PLAN OF BASEMENT.—1 Bottom of Amphitheatre. 2 Materia-Medica Museum. 5 Instructor's Room. 14 Students' Recreation Room. 15 Students' Locker. 17–19–22–23–25 Janitor's Quarters. 21 Dynamo Room. 26 Fan Room. 27 Buffer and Grinding Room. 30 Motor Room. 38 Sub-section Teaching, etc., in Physiology. 39 Alcohol Store Room. 40 Fan Room. 41 Toilet Rooms. 42 Pathological Preparation Room. 50 Bottom of Amphitheatre. 51 Research Room. 52 Repair Room. 53 Storage Room. 57 Pathological Store Room. 80 Physical Diagnosis, Bandaging, etc. 83 Store Room. 84–85 Fan Rooms. 86 Store Room. 93 Department of Physiology. 94 Pathological Store Room. 95 Fan Room. 96 Class Room.

tology, the front of which consists almost entirely of glass, is located so as to face a spacious court to the north, thus insuring excellent and uniform light, and admirably adapting it for microscopic work carried on by a large class. In a similar section of the building, east of the central hall, with similar front arrangements to ensure light

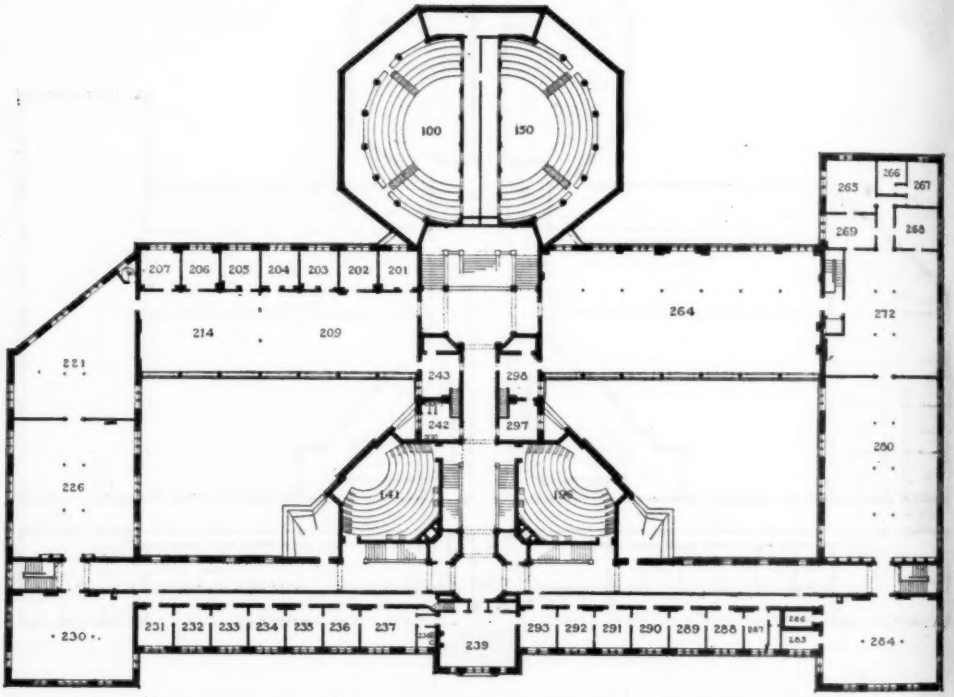
for microscopic work, are located two smaller laboratories to be employed in the teaching of surgical pathology, neuropathology and



FIRST FLOOR PLAN.—100 Amphitheatre. 104 Library. 105 Instructor of Pharmacy. 107 Storage Room. 114 Laboratory of Pharmacy. 115 Operator's Preparation Room. 116 Operating Room. 117 Animal Preparation Room. 118 Dark Room. 119 Respiration, Calorimetry. 120 Optical. 121 Circulation. 123 Nerve Muscle. 124 Digestion. 125 Special Senses. 126 Chemical. 127 Construction and Repair Shop. 130 Tinker Shop. 131 Seminar and Conference Room. 132–133 Advanced Physiology. 134 Assistant to Professor of Physiology. 136 Laboratory of Professor of Physiology. 137 Study of Professor of Physiology. 139 Toilet Room. 140 Pharmacodynamic Preparation Room. 141 Demonstration Room. 142 Pathological Preparation Room. 143 Professor Duhring. 150 Amphitheatre. 151 Storage Room. 152 Prof. H. C. Wood. 153 Weighing Room. 154 Chemical Room. 155 Research Room. 156 Research Room. 157 Dr. H. C. Wood, Jr. 164 Laboratory of Pharmacodynamics. 180 Students' Laboratory for Practical Exercises in Physiology. 181–182 Assistant Professor of Physiology. 183 First Assistant in Physiology. 184 Second Assistant in Physiology. 185 Third Assistant in Physiology. 187 Research Room. 188 Reading Room. 189 Library of Physiology. 190 Dean's Office. 191 General Office and Waiting Room. 192 Clerks' Office. 193 Ladies' Toilet Room. 194 General Information Bureau. 195 Physiological Preparation Room. 196 Demonstration Room. 197 Physiological Preparation Room, (Dental, Veterinary and Biological).

clinical pathological technology, and private rooms for the instructors in these branches are arranged to open upon these large labor-

atories. In order to provide for special occasions when a larger body of men are likely to require temporary accommodations than is ordinarily contemplated in either of these laboratories, it has been arranged that a movable partition may be withdrawn so as to throw



SECOND FLOOR PLAN.—201 Research Room. 202 Gynæcological Pathology. 203–204 Surgical Pathology. 205 Clinical Pathology. 206–207 Neuro-Pathology. 209 Surgical Pathological Laboratory. 214 Neuro-Pathological and Clinical Pathological Laboratory. 221 Seminar and Journal Room. 226 Advanced Pathological Histology. 230 Experimental Pathology. 231–236 Research and Assistant's Rooms. 237 Prof. A. J. Smith. 239 Pathological Office. 141–196 Demonstration Rooms. 242 Toilet Room. 243 Microscope Room. 264 Pathological Histological Laboratory. 265 Operating Room. 266 Photographic Dark Room. 267 Photographic and Drawing Room. 268 Museum and Preparation Room. 269 Operating Room. 272 Gross Morbid Anatomy. 280 Museum. 284 Pathological Bacteriology. 285 Sterilizing Room. 286 Dark Warm Room. 287 Refrigerator and Distilling Room. 288 Professor Tyson. 289 Professor Hirst. 290 Professor de Schweinitz. 291 Professor Clark. 292–293 Research Rooms. 297 Store Room. 298 Section Room. 3d floor of tower, Artists' Room. 4th floor of tower, Professor of Pathology.

the two rooms into one. In addition to the above apartments a number of small rooms devoted to storage or special technical work are provided upon this floor or elsewhere in the building in connection with the general chair of pathology.

"Besides the numerous laboratories, research rooms, etc., there are two demonstration and two lecture rooms in the building. The two demonstration rooms each seat 185 students. These rooms communicate with two preparation rooms each. At the rear of the building there are two large lecture rooms, each seating 400 students. Students enter these rooms from a landing at the main stair, midway between the first and second floors. The floors of the lecture rooms are on a level with the basement, and the lecturer will enter directly from the basement level, and all specimens needed to illustrate the lectures will be brought through this entrance, thus saving the crossing of the halls through which classes move.

"The most modern apparatus has been installed for light and heat and ventilation."

The formal exercises transferring the new laboratories to the University were held at 4 o'clock, and were imposing and dignified, and in every way fitting the occasion. There was a large attendance of representative and professional men, including members of the American Medical Association, who came by special train from Atlantic City, where they were convened in annual session. In the absence of the chairman of the Committee on Medical and Allied Schools, Dr. S. Weir Mitchell, the duty of making the presentation devolved upon J. Vaughan Merrick, one of the oldest trustees of the University, who spoke of the growth of the Medical School during the past thirty years, it having at the beginning of this period a single building on Ninth Street. In accepting the new laboratories, Dr. Charles C. Harrison, Provost of the University, said in part, after referring to the ideals and purposes had in mind in the construction of this building: "This great building bears no one person's name, and is the result of no single benefaction. It has been built up, rather, by numerous gifts, memorials and offerings, so that many hearts are turning toward this place to-day, and will rejoice with us all when I announce that no shadow of debt falls upon the new medical laboratories of the University of Pennsylvania."

Then followed addresses by eminent medical men from four of the leading universities of the United States, which we are able to publish in part.

TEACHING OF PHYSIOLOGY IN MEDICAL SCHOOLS.

By Dr. H. P. Bowditch,
Professor of Physiology, Harvard University.

In bringing the congratulations of a sister institution on the occasion of this important step taken by the University of Pennsylvania in the advancement of medical education, it may, perhaps, be appropriate for me to dwell upon the proper relation of the sciences, so sumptuously installed in these new buildings, to the general work of medical education.

With regard to the methods employed in giving instruction in physiology, the great change which has recently taken place in all our large medical schools cannot fail to strike even the most superficial observer. This change, which has been quietly going on for the last ten or fifteen years, consists mainly in the great development of the laboratory method of instruction. This is but a logical result of clearly apprehending the fact that physiology is merely the physics and chemistry of living matter and of applying to that science the methods of instruction already adopted and approved by the physicist and the chemist. The extension of the laboratory method is; however, also to be regarded as a reaction against the too exclusive use of the so-called didactic method of instruction, as a result of which students, getting their knowledge wholly from lectures and text-books, often failed to realize that physiology is just as truly an experimental science as either physics or chemistry, and were thus insensibly led to depend upon authority instead of upon the direct observation of nature.

Of the great educational importance of this reaction and of the changed attitude of the student-mind determined by it there can be but one opinion. Whether we consider that the most important object of medical education is to "train for power" (to use President Eliot's phrase) or regard the imparting of information as the chief end to be sought, the laboratory method has distinct advantages over all other methods. Contact with the phenomena themselves and not with descriptions of them trains the mind of the student for power by teaching him to observe carefully and reason correctly, while, as a means of imparting information, the laboratory method has the great advantage of giving the best of all knowledge, viz., that which comes from personal experience. So valuable to the physician is the habit of mind thus cultivated that it may well be

doubted whether any preparation for a medical career is better than that afforded by a physiological laboratory. There are, of course, many physicians of the highest rank who have not enjoyed the advantages of a laboratory training, but they will, I think, all be found to have habits of accurate observation and careful reasoning, mental qualities which it is the special function of the laboratory to foster and cultivate.

Having thus borne testimony to the value of the laboratory method, let me ask you to consider the limits, if any there are, to the application of this form of instruction.

The most superficial examination of the question makes it clear that laboratory methods are extremely costly both in time and money, and that there are, in all the medical sciences, many subjects which cannot well be taught in this way.

It is thus evident that a considerable portion of the instruction in physiology must be given by didactic methods, simply because this is the only practicable way of imparting necessary information. The ignorance of a young practitioner called to his first case of diabetes would scarcely be excused on the ground that he was "trained for power," and that there were no experiments on glycogenesis in his laboratory course in physiology.

In this connection it will be well to inquire how far didactic methods of instruction afford opportunities for mental training, and here I shall be compelled, I fear, to take issue with those of my professional brethren who regard text-books and lecture-room instruction as essentially lifeless in their character. It seems to me, on the contrary, that the best lecturing is often the source of a distinct mental stimulus, for, as Dr. Mitchell has well said, it "does not so much think for you as invite you to think along suggested lines of inquiry."

In every department of medicine advanced instruction necessarily deals with subjects which lie within what Foster has called the "penumbra" of solid scientific acquisition, and about which conflicting views are therefore certain to be held. It is in inviting thought with regard to the evidence an experienced lecturer has his best opportunity to train the minds of his hearers. Other opportunities are also afforded by the historical presentation of subjects, about which differences of opinion no longer exist, for there are few things more instructive than to follow up step by step the lines by which

our knowledge has advanced, noting the marks which distinguish the paths which have been trodden successfully from those which have turned out to be "no thoroughfare." Even better opportunities for mental training than those which the lecture-room presents are afforded by the recitation, for here the minds of the teacher and the pupil are brought most closely into contact, the pupil's difficulties are appreciated by the instructor, and the point of view of the teacher can be learned by the pupil. It has always seemed to me that no higher enjoyment falls to the lot of the teacher than that which he experiences when, by a series of carefully considered questions, he leads his pupil onward from the known to the unknown, and notes the gleam of intelligence which illumines his countenance as a subject, previously obscure, becomes clear, as a result of his own mental operations guided by his teacher's skillful questions. It thus appears that no monopoly of opportunities for mental training can be claimed for the laboratory method of instruction, while, for the purpose of imparting necessary information, laboratory work must, for reasons just given, be supplemented by didactic instruction.

Recognizing, therefore, the importance of both the laboratory and the lecture room as educational agencies, let us consider what should be their relation to each other. The question is often formulated thus: Shall the experiments illustrate the lecture or shall the lecture explain the experiments? If forced to decide between these alternatives, I confess that I should be inclined to choose the latter, for, by giving precedence to the experiments, the teacher conforms his instruction to the law of growth of an experimental science. There are, however, many departments of physiology in which the experimental data suited for elementary laboratory instruction bear so small a proportion to the sum total of the knowledge which must be imparted to the student that the didactic instruction necessarily assumes the more important position and the lectures cannot, without a forced use of language, be described as explanatory of the experiments. It seems to me, therefore, that the wisest course at the present time is not to attempt to decide between the two above-mentioned alternatives, but to let the method of instruction vary with the subject.

In thus classifying physiological subjects according to the methods best suited for teaching them, it must be borne in mind that such a

classification must necessarily be preliminary and tentative, and that improvements in laboratory technique will often result in transferring certain subjects into that class in which the student has the inestimable advantage of direct personal contact with the phenomena to be studied. Indeed, there is nothing more encouraging to those who are engaged in working out these educational problems than the discovery that medical students, under proper instruction, can be safely trusted to employ the most refined methods of physiological research. Thus in the Harvard Medical School capillary electrometers have been manufactured by the hundred and used successfully by first-year students.

It seems to me, therefore, evident that the reaction against purely didactic methods of instruction is a movement to be heartily welcomed; but, like all other reforms, it should be carefully guided, lest useful as well as useless things be swept away. It should be borne in mind that it is quite as possible to abuse the laboratory as the didactic method of instruction, and that, in all schemes of education, a good teacher with a bad method is more effective than a bad teacher with a good method.

THE LATENT POWER IN, AND THE INFLUENCES EMANATING FROM, THE LABORATORY.

By Prof. R. H. Chittenden,
Director of the Sheffield Scientific School, Yale University.

Where could be found a more striking, more convincing demonstration of the great advancement made of late years in the development of the scientific branches of medicine than the present laboratories afford. So long as medicine and the related sciences were crude and inexact, so long as our knowledge was based mainly upon theories and hypotheses of doubtful origin, and still more questionable value, the laboratory counted for little. As scientific knowledge advanced, however, and it gradually became apparent that true progress was to be made only, or mainly, by actual observation and experiment, the laboratory became the field of work, and there gradually came full recognition of the necessity for practical study of the many questions that were constantly arising for settlement. No longer satisfied by the dogmatic statements of the earlier writers, thoughtful people began to ask for facts and demonstration, and the laboratory and its facilities grew side by side with a growing craving

for exact knowledge. Laboratories, such as we see before us to-day, testify in no uncertain language to the development of methods of exact study, and the fact that there is need of such facilities as a part of the equipment by which students are to be trained in the science and art of medicine testifies more fully than any words can do to the enormous advance that has taken place in the evolution of scientific medicine and in the consequent development of medical education. To pass through these laboratories, which are to-day thrown open for inspection, inspires one not only with admiration, but also with a full appreciation of the increased facilities for scientific work afforded, and with the fact that our knowledge has grown to such proportions that there is need of this practical exposition in teaching. In other words, we see in these commodious laboratories clear demonstration that medicine has truly become an exact science.

The laboratory is the foundation stone upon which is to be reared our temple of knowledge, and we do wisely when we build this foundation large and broad, a fitting support for a structure that shall tower aloft, casting abroad over the land a light bright enough to pierce the darkness of superstition and ignorance, and shedding a ray of hope for the relief of the afflicted and for the betterment of mankind. The laboratory, when under the supervision of a wise leader, properly trained and alive to the importance of what a true laboratory should provide, becomes to the student a revelation and an inspiration. Here he sees, perhaps for the first time, how true knowledge is gained, how facts are acquired, and he learns to observe, to see for himself those mysteries which, when described even by the words of a master, appear vague and indefinite. In the laboratory, however, he is brought face to face with nature, and not only does he acquire knowledge of nature's ways, but, what is of even greater importance, he begins to learn something of himself, of his own powers of observation, of his own ability as an observer and interpreter of what nature has to show him. Gradually there creeps over him a confidence in himself; he begins to feel free and independent; he is no longer a slave to his text-book, no longer an unreasoning believer in the printed statement of the highest authority. Like Vesalius of old, who, following venerated custom, tried to believe Galen rather than his own eyes, he is ready to throw to the winds the writings of others and to believe what he has himself seen.

This is what the laboratory, when made proper use of, does for the student of medicine. It helps him on to man's estate, to the freedom of intellectual supremacy; it leads him into the field of logical reasoning; it teaches him to see and to think for himself. It affords that training which leads to the development of the wise and skillful practitioner of medicine.

Finally, to the exceptional mind, to him in whom burns the unquenchable fire of genius, the laboratory provides the means by which discoveries of the greatest importance are brought to light. It may be a matter of purely scientific or theoretical interest. On the other hand, it may be a matter of the greatest practical importance; but, whether the one or the other, knowledge is broadened and the world is enriched by a new fact added to the sum of human wisdom. And so I congratulate you, of the University of Pennsylvania, upon these new laboratories which promise so much for the dissemination of true knowledge, and which hold out the hope of increased enlightenment on many dark chapters which still confront us as we look through the volumes which contain our knowledge of the structure and functions of the human body. And what is your gain is also our gain and the gain of the whole world, for science knows no boundaries, and a new fact, full of import for health or disease, once brought to light, becomes the property of the world and casts its blessing upon all. May these laboratories fulfil your highest expectations and constitute a never-failing power for good in the University and in the community at large.

It has been said that medicine, like Janus of old, in a good sense, bears a double face. On the one hand, she is an empiric; on the other a scientist—and science is ever rendering the practice of medicine more rational, more scientific. To-day medicine stands closely interlocked with science. It is a truism to say that the student of medicine must have training in those underlying biological sciences which are so essential for the true understanding of vital phenomena. As Professor Sherrington has well expressed it in a recent address, it is "necessary that the man go forth from his school equipped not only with the present applications of science to disease, but so possessed of the root principles of the sciences adjunct to medicine that he may grasp and intelligently use the further developments of scientific medicine after he is weaned from his instructors and the school. . . . What truer safeguard can a man have—alone, it

it may be, and isolated from the centres of knowledge; what truer safeguard can he have against all the pseudoscientific quackeries of the day than some real knowledge of the principles of the sciences along whose lines the discoveries of medicine must develop?" And we may ask ourselves the question: Is there any one science to-day which promises more aid (direct and indirect) to the science and art of medicine than physiological chemistry? Surely, we have not only the promise, but the fulfilment of the promise, in the many discoveries which have come of late years from the various laboratories of physiological chemistry scattered throughout the world, and if we grant the truth of this contention, then certainly we must admit that physiological chemistry is destined to play an important part in the development of medical education, since it is adding continually new discoveries which bear directly upon our knowledge of physiological and pathological processes, as well as discoveries which bear directly upon the art of medicine. Surely, there can be no clear or profound knowledge of abnormal or pathological processes without a thorough understanding of the normal processes of the body. The physiological must be clearly comprehended before we can intelligently unravel the pathological, and at almost every turn in physiology—in the study of normal function—we come in contact with some phase of physiological chemistry. The chemical processes of the body are indeed manifold, and it would be a one-sided physiology that attempted to explain the processes of the body without recourse to the aid furnished by physiological chemistry.

The laboratories of physiological chemistry have indeed been fruitful sources of knowledge. In them, under the guidance of masters of their science, truths have been demonstrated that have contributed no small share to the development of modern scientific medicine, and the development of medical education has been influenced in no small degree by the brilliant discoveries that have been inspired by the master minds of this particular science.

Consider, by way of illustration, the Strassburg Laboratory of Physiological Chemistry during the active life of Felix Hoppe-Seyler. Coming to Strassburg from Tübingen, in 1872, Hoppe-Seyler gradually created there an institute which attracted students from all parts of the world, and up to the time of his death, in 1895, there was a never-ending series of important papers in physiologi-

cal chemistry, many of which have left an indelible imprint upon scientific medicine.

It would be a mistake, however, to assume that the influence of the Strassburg laboratory was limited to these scientific discoveries, valuable though they were and still are. It is only necessary to mention the names of two well-known physiological chemists, viz., Baumann and Kossel, at one time students in the Strassburg Laboratory, to understand the nature of this other influence which was constantly exerted during the lifetime of Hoppe-Seyler, and is still exerted by his illustrious successor, Professor Hofmeister. In Baumann and Kossel, as students and assistants in the Strassburg Laboratory, were found the exceptional minds ready to profit in highest degree from the instruction and inspiration provided. The smouldering fire of genius was fanned into flame, and two more physiological chemists were started on their way as teachers and investigators in their chosen field. One, as professor at the University of Freiburg, lived long enough to make his name known wherever physiology and medicine are recognized as experimental sciences. The other, as professor at Marburg and now at the University of Heidelberg, is at the height of his career as one of the foremost physiological chemists of this generation, adding each year some new fact to our store of knowledge of physiology and experimental medicine.

Such, briefly depicted, is the character of the influences that may emanate from a single laboratory, and I would use the illustration in a two-fold manner. First, to indicate the enormous latent power in a laboratory of any kind, properly equipped and wisely conducted, for the judicious training of students and for the discovery of important scientific truths—a power to which there is almost no limitation. Second, to indicate the intimate relationship which unquestionably exists between physiological chemistry and scientific medicine. Finally, as an ardent believer in the growing importance of physiological chemistry as a means by which many of the intricate problems which to-day confront us in the science and art of medicine are destined to be unraveled, I venture to prophesy that in the development of medical education, in harmony with the advance of medical knowledge, physiological chemistry will be found to occupy a more and more conspicuous position.

THE DEVELOPMENT AND IMPORTANCE OF PATHOLOGY.

By Dr. George Dock,
Professor of Medicine, University of Michigan.

It is hard to believe, but none the less true, that when this school was founded, 140 years ago, medicine was but little in advance of its condition 2,000 years before. In the long interval medical knowledge had traveled in circles, never getting very far beyond the elementary pathological and clinical facts known in the age of Pericles.

In the five centuries between Hippocrates and Galen there was no progress at all, and for nearly fifteen hundred years Galen and Hippocrates, with Aristotle, were deemed as infallible in medicine as the Fathers of the Church were in theology. Sydenham, inferior to the Greek and Roman masters in breadth of knowledge, was the first to apply the new principles of Baconian philosophy in medicine, and Sydenham's life was separated from that of John Morgan, the father of the Medical Department, by less than fifty years. Though the scholars of the Renaissance had shown that the Greek and Roman texts used through the Middle Ages were sadly corrupted from the originals, and though dissection of the human body was practiced in the fourteenth century by Modino and Guy of Chauliac, it was not until the genius of Vesalius dawned (1514–1564) that the first severe blow was given to Galen's authority. About the same time pathological anatomy began to be cultivated, but the early observations were devoted chiefly to monstrosities and other apparently miraculous formations, and had little more relation with pathology than the stones collected by a small boy have to geology. The need of more rational methods was clearly stated by Bacon ("Of the Advancement of Learning." Book IV, Chap. 2), who urged the study of case-histories, the cultivation of morbid anatomy and of vivisection of animals. The revelations of Harvey were essential to the ultimate development of pathology, but the first application of physiology, as the first application of physics and chemistry to pathology, caused confusion rather than enlightenment. Medicine had gathered in its course through the dark ages so much rubbish, such as magic, astrology, polypharmacy, the doctrine of signatures and all manner of mystic beliefs that still survive to vex the impatient, that it could follow but slowly the steep path of dis-

covery. Pathology consisted of dogma after dogma, system after system, each one having vital defects of basis or conclusion, and no radical change was possible until, in the eighteenth century, pathological anatomy was cultivated with all the enthusiasm of the early collectors, but with the definite aim of throwing light on medicine. Lancisi and Senac, in the first part of the century, are still quoted by modern writers, but it was Morgagni (1682–1771) who gave the first important impetus to pathology. In his epoch-making work on "The Seats and Causes of Diseases Investigated by Anatomy" (1761–1767)—how significant the title!—the result of inexhaustible energy and keen reflection during half a century—he began the systematic investigation of the differences between normal and morbid conditions, and the relation of diseased organs to clinical phenomena, including diagnosis and prognosis. The visit of John Morgan to the venerable author and the presentation to him, his relative—"affini suo"—as the old man playfully called the Philadelphian, form an interesting link between the origin of modern pathology and the University of Pennsylvania. Morgagni examined not merely rare and curious cases, but especially diseases of common occurrence, and in all his descriptions and conclusions he showed such accuracy and judgment that he not only made pathological anatomy the basis of medicine, but served as a guide and model to all who followed him. By an interesting coincidence, in the same year in which the first volume of Morgagni's work appeared, Leopold Auenbrugger published his book of percussion, opening the way to anatomic diagnosis, but the world was not yet ready for so great a discovery and could not use it for fifty years. Morgagni, however, great as his influence was, was not a pathologist, but a clinician with a firm anatomical basis for his reasoning. The broader field was soon occupied by John Hunter (1728–1793) and Xavier Bichat (1771–1802). Not less indefatigable than the Italian, and with a matchless fertility of mind and precision of observation and experimentation, Hunter included comparative pathology in his search, and so influenced men's minds that ever since his time diseases have been studied as biologists study other natural phenomena. The marvelous insight of Bichat made it clear that the seats of disease were to be sought not merely in organs, but in the tissues that make up the organs, and also that the fluids of the body have an important part in pathology, at least as carriers of disease. During

and soon after the brief but momentous activity of Bichat there was a period that had an effect on pathology not unlike that of the French Revolution on political and social affairs, destroying medical ignorance as the latter swept away feudal abuses. And although medicine, too, had its Bourbons and reactionaries, its course was more steadily forward than that of contemporary politics. It would take too long to describe the course of pathological anatomy after Hunter and Bichat, and the names of Baillie, Bayle, Bretonneau, Corvisart, Laennes, Louis, Bright and Rokitansky are only the greater stars of a large and brilliant galaxy. These men not only put pathology on a firm foundation by showing the anatomic changes in the most important diseases, but they gave clinical medicine a positive basis by demonstrating the relation of the anatomic alterations to the newly discovered signs, often worked out by the same hands that revealed the anatomic changes. They showed how, by the cultivation of the hand, eye and ear, by the microscope and test tube, diagnosis could reach a precision impossible by the use of symptoms alone.

But while pathological anatomy was having this salutary effect on practical medicine, it was also opening up larger vistas in the science of pathology. The creative mind of Johannes Mueller and the unparalleled activity of Virchow caused a productiveness greater than ever before. Mueller forever destroyed the power of dogma in pathology, and in its place put method.

There are certain important aspects of the study and teaching of pathology that may be considered with advantage at such a time and in such a place. "Practical teaching" and "laboratory methods" are the watchwords of the day, but it is sometimes possible to see these methods carried on to the neglect of real learning. Without actual handling, seeing, analyzing, drawing and describing, such a topic as pathology cannot be mastered, but to do it properly requires sound preparation, cultivated habits of thought, patience, the necessary raw material, reagents and apparatus, and sufficient time. And yet time, in our crowded medical courses, is very often lacking, and the student is expected to get along very often without most of the other things. Few can learn to draw, paint or play a musical instrument without a teacher, and usually a certain degree of excellence is required of such teachers, and yet medical students are often expected to master various laboratory branches with few teachers,

and these very often poorly informed and untrained in imparted knowledge. A distinct need in the teaching of pathology is a sufficient number of able teachers. In any natural science, if not in all sciences, it is essential that the teacher should be an investigator. In pathology, the outlook of which changes so rapidly, nothing but participation in the development of knowledge will prevent the rusting of the faculties. This does not mean that every teacher and assistant in a laboratory must be a genius. Technical details and the making of autopsies can be left to dexterous prosecutors who are working to win their spurs; the examination of students' work can be done by any well-informed, critical and conscientious young worker, but the direction of the work should be in the hands of the ablest man available, well trained, original in mind, receptive and sympathetic for every other branch of science.

The elevation of the laboratory has led to a top-heavy way of teaching in some schools, by encouraging students to do advanced original work before their foundation is sure. The advantages of gradual advance from known to unknown are here abandoned, as we can sometimes see when students write articles on the protozoan origin of cancer before they have seen a dozen different examples of cancer or examined a known protozoon.

The insufficient number of teachers in nearly all laboratories may have had something to do with another interesting development of the present time—the demand for research in institutions free from teaching duties, though this has come partly, no doubt, from a laudable desire to more rapidly advance science for itself. The view that research can only be done by hermit-investigators is a pernicious one in many ways. The original investigator, of course, needs time and often seclusion to perfect his work, and there have been and always will be some who can only work in retirement. For this end academies and institutes have in the past offered facilities and may with advantage be assisted in still further doing so. On the other hand, endowments to existing teaching laboratories could often more economically attain all desirable ends. The general statement that research is incompatible with teaching positions, even those entailing considerable expenditure of time, is refuted by the examples of such men as Helmholtz, Ludwig, His and a host of others within the most productive period of science. Not only is the combination possible, but it might be argued with considerable

success that the ultimate gain to knowledge would be greater by keeping the example and methods of great investigators closely before younger minds, for these are things that cannot be transmitted by lectures or books.

The hermit idea has even been applied to plans for hospitals. This also has sources of error—the one, that good work can be done in a hospital in which no research is carried out. The truth is that hospital physicians (and the argument is true of those in private practice) cannot remain efficient if they cease investigating. The other, hardly necessary to mention, because it refutes itself, depends on the fact that a hospital with research as its chief object, and relief of suffering secondary, is inconceivable. If hospitals can only be stimulated to better work by the endowment of institutes for clinical experiment, it might be worth the trial, but the whole course of medicine shows such a trial is unnecessary. The better way would be to furnish hospitals, including asylums of various kinds, with means of research, laboratories, apparatus and trained workers; to have a sufficiently large corps of clinicians to carry on modern methods of investigating and treating the sick, and to choose for such positions only those who are capable of advancing the subject.

The method that has been accepted as the solution of the problem in pathology is to appoint assistants to so-called fellowships, often with unnecessary or unwise restrictions on their time and work, and without proper facilities for either work or instruction. Often the ambitions of such appointees are so far removed from their positions that their own time, as well as that of those who should guide them, is thrown away. Science gains nothing. Thomas Fuller's remark is applicable here, that "many can play Apollo's lyre who are not able to guide his chariot," and the advance of knowledge would often gain more by giving an overworked teacher a servant at ten dollars a week than one or a half-dozen fellows at $500 or $1,000 a year each.

Another obstacle to the growth of pathology, and particularly of pathologic anatomy, is the neglect of or objection to autopsies, a difficulty that affects physicians in all kinds of practice, hospital or private, by depriving them of the most powerful incentive to careful work. This is the one feature that makes the scientific part of medical education in America still inferior to that of Europe, and

one that prevents the keenest critical spirit from developing in the non-operative departments of practical medicine.

The difficulty depends partly on a sentiment that is not new in the history of civilization, and is not associated, as is sometimes thought, with any one creed, race or color. The Roman, who thought it not only diverting but instructive to see the butchery of the arena, would never think of permitting the dissection of a cadaver in order to learn anything useful, and Charles V, who thought little of having men dissected alive, tried to prevent them from dissection when dead. In some countries that we look upon as much below our own in civilization, benevolent people leave money to provide for autopsies on those whose families are unable to pay to have such operations made, while in America, so-called philanthropists busy themselves to prevent the bodies of those who never benefited humanity in life from doing so after death by reaching the dissecting table. In the lavish waste of life and health that occurred in army camps in the Spanish-American war it was no less instructive than depressing to see the neglect of pathologic anatomy. For weeks the question as to whether there was typhoid fever in the camps was met by contradictory assertions. It took months to get microscopes, culture and capable observers to the hospital. Yet a half-dozen autopsies could have settled the problem very quickly. While large sums were spent for instruments to treat wounds that never came, some of the largest hospitals did not possess a single autopsy instrument. It was said by those in high places that people would not like to have the dead soldiers examined; but can we suppose that those who were willing to risk the mutilation of the machete would object to a decent autopsy, or that men who thought it sweet and glorious to die for their country would not be willing to be examined post mortem for the benefit of others?

The difficulty in respect to autopsies does not depend on public sentiment alone, but on a certain neglect on our own part. I think we may hope that as pathology gets everywhere out of cellars and back rooms, and has local habitation such as we see here, its cultivation will assume a broader and more independent character.

THE DEVELOPMENT OF THE MEDICAL LABORATORIES OF THE UNIVERSITY OF PENNSYLVANIA.

By Dr. Horatio C. Wood,
Professor of Therapeutics in the University of Pennsylvania.

In 1832, when the waves of excitement due to enraged Indians and epidemic cholera had subsided about Fort Dearborn on the shores of the Michigan Lake, 150 people represented the future city of Chicago. In 1871, less than half a century later, a great city lay in ashes, but with forces unabated and hope undismayed. It may well be that the man who contended with savages and pestilence saw the growth of the great metropolis and its purification by fire.

It has so happened that my life has seen the growth of the laboratories of the Medical Department of the University of Pennsylvania from their first shadow of existence to their present magnificence, and it has seemed to me that perhaps the first minutes of the half hour allotted to me in the present services could not be better spent than in showing the development of the Now out of the Then.

In all ultrascientific treatises it is essential to begin with the definition of terms. Owing to the fact that in the State of Pennsylvania, to modify, enlarge, or pervert the English language is not a penal offence, the term "laboratory" is often misused in medical catalogues and other aristocratic positions. Webster defines "laboratory" as "a workshop of a chemist; also a place devoted to experiments in any branch of natural science, as a chemical, physical or biological laboratory." Frequently a place where lungs and spinal cords and various other things are cut and studied with the microscope is spoken of as a pathological laboratory. Perhaps by-and-by we shall call a room where potatoes have their eyes examined, their diseased parts excised, and themselves surgically prepared for the resurrection of the springtime, a potato laboratory. In the earlier part, at least, of the present address the term laboratory is used in its original sense, to denote not a room, nor a house, nor anything, but a place—it may be a mansion, it may be four squares of brick pavement—within which experiments are performed.

Somewhere in the early sixties, probably in 1864 or 1865, having a desire to study medicine experimentally, I found that the only man in the city of Philadelphia who could give me practical instruc-

tion was Dr. S. Weir Mitchell, who then had one or two rooms in the famous Chance Street building, the subsequent scene of the labors of Agnew, Keen, and others, and who was then engaged in various experimental investigations on the nervous system. It was not long before he made me a proposition to assist him in his researches and to publish with him the results of our work. This connection would have been formed had it not been for Dr. George B. Wood, who, by the greatness of his renown, the force of his character, the extent of his pecuniary resources, and his lack of direct heirs, dominated at that time the College of Physicians, the Philosophical Society, and the Medical Department of the University, much more his struggling nephew, who, he insisted, by studying botany, should prepare himself for a career in materia medica and therapeutics: and so, having been instructed by Dr. Mitchell how to insert a canula into an artery, I graduated in practical physiology, and took up actively the study of botany and materia medica until three or four years later, when, having mastered the elements of those sciences, it was possible for me to revert to the study of experimental medicine.

For the work to be done a workshop was necessary. The private treasury was so low that the luxury of a room in Chance Street was unthinkable. By this time Dr. George B. Wood had so advanced in age that he wanted the care of his garden, greenhouses and stables lifted from his shoulders, and made me his deputy. Having this authority, with his consent it was possible for me to use, according to the different stages of the weather, the back of the large yard, the stable, or the greenhouses as an experimental laboratory. Fortunately, at that time antisepsis had not been heard of.

Instruments were very few. The old rifleman on the shores of Lake Michigan brought down unerringly the deer or the Indian with a weapon which the modern sportsman or fighter would consider hopeless; and so the results of work in this primitive laboratory were accurate and permanent, although my young physiological hearers will smile at the statement that, with the aid of tin- and other smiths, we made our own instruments. Our hæmadynomometers, for instance, were obtained by boring a hole in the iron flasks in which mercury is ordinarily stored, inserting a U-shaped glass tube, fastening on a home-made scale, and then measuring blood-pressure by the eye. Under such circumstances was finished the first complete

investigation of a human disease ever made on animals, namely, that on "Sunstroke, or Thermic Fever," published in 1870, a research which was so complete and final that of it Professor Osler wrote in 1895: "Very little has been added to our knowledge of sunstrokes since its completion." Some of the papers which emanated from this impromptu laboratory have had their results challenged, but a reinvestigation of the subject has in all cases confirmed the original conclusions, so that the accuracy of the out-door-greenhouse-stable work has been established by time.

In 1870 the Medical Department of the University moved from Ninth Street to its present location; but, although one or two rooms were assigned to the professor of physiology, no experimental work seems to have been done in them, so that for some years longer the institution was still dependent upon the bountifulness of Dr. George B. Wood for the continuation of its laboratory activity.

It is a rather remarkable fact, though probably in accordance with the ordinary laws of progress, that in passing from the old to the new régime at the University, there were appointed demonstrators who were experimentalists and who from time to time made various researches, although the professor to whom they were subordinate was in no proper sense a practical physiologist. The first demonstrator of physiology was Dr. Henry C. Chapman, appointed in 1876; he was followed in the fall of 1877 by Dr. B. F. Lautenbach, who in turn was succeeded in 1878 by Dr. Robert Meade Smith.

In 1876 I was elected to the chair of therapeutics, being the first professor suffering from the itch for experimentation who had ever been injected into the Medical Department of the University, chemists excepted. All the rooms which might possibly have been used for a pharmacological laboratory were fully occupied; the plans of the building had, however, fortunately been chiefly overlooked by Professor Rogers, who had reserved the lion's share for himself, and after some discussion it was decided that some of Professor Rogers' rooms should be occupied by the janitor, and the apartment which had been allotted to that worthy should be given to me. No allowance was made by the University for the furnishing of these rooms or for the purchase of furniture or of apparatus. I remember with what glee I bought for five dollars at the auction of the débris of the great Centennial celebration, in 1876, a very large heavy table which had been made for the purpose of the draughts-

man, but whose fate was to become the centerpiece of a physiological laboratory.

The Smithsonian Institute granted me $1,000 to assist in a research on fever, to which out of my own funds another $1,000 was added, and so the necessary apparatus was invented and manufactured, and all went as merry as the marriage bell. But, mark you, of necessity the laboratory contained no apparatus except that which was bought for some special investigation. Much horror was caused by a letter received from a distinguished foreign physiologist, who wrote directly after the publication of the work on fever, that "since you are making such large researches in America I have intended to go and see your laboratories," and the relief was great when at the end of the letter were found the words, "but I find that circumstances will prevent my visiting you."

It is, perhaps, worthy of record, as told me by Professor Reichert in 1886, that when he entered upon his duties he found in the laboratories no apparatus which was not my personal property; so that the first piece of physiological apparatus which ever belonged to the University was a Ludwig's kymographion, presented by Dr. S. Weir Mitchell shortly after Professor Reichert's election, an apparatus which, like its donor, was so well constructed that up to the present day it continues in its career of usefulness with its forces seemingly unabated.

During recent years the development of the Experimental Laboratory of the Medical Department of the University has been rapidly progressive. The election of Dr. Simon Flexner to the Chair of Pathology in 1899 led to rapid growth in the work on experimental pathology, and in 1895 a new impetus was given to experimental researches by the creation and endowment of the Pepper Clinical Laboratory, an institution that has already made itself an enviable reputation in the recent annals of experimental science.

That much work has been achieved in these laboratories is shown by the fact that, independently of the Pepper laboratory, there have been published from them 250 experimental papers embracing a very wide range of physiological, pharmacological and pathological subjects.

Hitherto we have been speaking of the experimental laboratory, but the term "laboratory" is also now used as the name of the workshop in which students are taught the practical details of

the underlying medical sciences, and the building in which we now are has been erected chiefly to meet in the University the needs of the new method of instruction. There is in some quarters a tendency to question the value of this laboratory teaching. Without practical study, however, the student never can apprehend the foundation principles and methods of the sciences, so that if physiology and pathology are to the medical student worth studying at all, they are worth studying by the only method that can bring real knowledge and apprehension. Moreover, day by day in the ordinary practice of medicine the use of instruments of precision becomes more and more important, and, perhaps, as beneficial a result as is achieved by the laboratory is the acquiring by the student of the power of using delicate scientific apparatus and of correctly observing and recording the results reached. If nothing further were reached than to teach the student the proper use of his especial senses, much would be gained. To be able to hear, to see, to apprehend—that is knowledge above price to the naturally purblind and purdeaf children of men.

The growth of science, the multiplication of instruments, the refinement of technique, make the well-equipped laboratory to-day essential, but to the end the Man will survive as the dominant factor. I remember years ago in Philadelphia a group of physicians who were marvelously acquainted with the microscope, who spent their time in testing lenses, working with polariscopes, and studying eyepieces and adjustments; vain labor was it, yielding but barren fruitage. Of such as these Professor Leidy said to me one day: "It is not the object glass but that which is above the eye-piece that brings the result." Leidy knew comparatively little about the construction of the microscope, but using it, not as an object of study, but as an instrument, his master mind laid much of the foundation of our present knowledge of the lower forms of animal life.

If, now, these great laboratories are to be used in a manner worthy of their possibilities, it is essential that they be employed as instruments, and that the men should be found who shall use them, not only for the purposes of teaching, but also for the purposes of advancing the boundaries of medical science.

The man having been found, it is essential that he be properly handled, if you will pardon the borrowing of an athletic term. Formerly our professors of physiology and pathology were medical

practitioners; but what has been gained so far as the higher uses of the man are concerned, if he has been relieved from the burden of medical practice to be crushed under the burden of excessive teaching? This is the peril of the hour so far as medical science is concerned. May I quote from the published report of a sister institution, which we all delight to honor? From 1896 to 1900 the professor in charge published thirteen original papers, all, I believe, entirely his own work, and as valuable as pure water flowing from a mountain spring. In the fall of 1900 a new and much expanded physiological course went into effect; in the three years subsequent to this the professor published one paper, with the assistance of a co-worker, probably a student. Why? Evidently because one back already loaded with a crate of earthenware cannot carry also a pack of dry goods, even though these goods be silken fabrics of deftest weaving, brilliant with the sunshine or dreamy with the mystery of the far-off Orient.

It cannot be gainsaid that the requirements of increasing knowledge and the improved methods of modern teaching make instruction far more laborious than it used to be. How, then, is this recent danger to be averted? Simply by increasing the personnel of the teaching staff. This means increase of expenses, so that a laboratory like the present increses the expenses of the medical school not only by the three or four thousand dollars a year which is required simply to keep it clean, warm and light, but also by requiring an increase of its staff of officers, unless its great opportunities are to be wasted. On the other hand, medical classes are being reduced by the higher standard of education required, by the multiplication of medical teaching institutes, and probably in the near future by the lessening of the demands for the profession through the improvements of sanitation.

With greater need for money there is less income from students. Endowments are becoming as essential for medical departments as for other technical schools, and the institution which fails to get such endowments must in the long run be left behind. Better to have small laboratories with large endowments than large laboratories with small endowments. Fortunate it is for the Medical Department of the University of Pennsylvania that in the character and record of its provost it has a guarantee that that which has been created shall not fail of use.

But, Fellow Alumni of the University of Pennsylvania and all persons who are interested in the growth of this our Alma Mater not only as a centre of medical teaching, but also of medical thought and progress, we have no right to expect that one man or a few men shall obtain the pecuniary foundations upon which medical advancement must rest. It is an extraordinary fact that so far the technical schools in America which have received the least support are those connected with a profession which comes into the closest contact with the lives of the whole people. Are doctors afraid to talk freely of the needs of medical laboratories and of medical schools for pecuniary assistance? Is there a lack of enthusiasm among us? Or is it that morbid dread of financial discussion which led Dr. George B. Wood, as I have often heard him say, always to take the other side of the street when he saw a man approaching to whom he had sent a bill for services rendered? I know not; but certainly we are somehow at fault in not making plain, not *our* needs, but for the people's needs—for better education of doctors who shall serve them, and urgent hurry in the growth of that science which each day lifts more and more of the physical ills that burden the race.

The profession, however, has not been so recusant as at first sight appears in this matter. To the modern school of medicine the hospital is a necessity, and in the foundation of hospitals the medical profession has not been idle.

Sometime in the latter part of the sixties Professor Stillé was delivering in the Academy of Music one of those old-time commencement addresses in which the central waxen lay-figure of platitudes was clothed in the finest garments of pure and fashionable English. While semi-dozing in a carefully selected dark corner the thought came to me "we must have a hospital when we move the Medical Department over the river." The late Dr. William F. Norris, known to us at that time as "Bill Norris," sat next to me. I nudged him and gave him the benefit of my thought. He said, "Let us talk it over after the ceremonies with Pepper," whom we were already selecting as the natural leader of our party. This was done, and we finally, notwithstanding the almost contemptuous disregard of our elders, obtained permission from the Board of Trustees to make the attempt. Dr. George B. Wood gave us a subscription of $10,000. Mr. Henry C. Lea agreed to pay, and subsequently did pay, the last $2,500 on every $100,000 up to

$500,000, and we went to work. For the ground upon which to build the hospital we applied, with final success, to the city, and then we essayed the Legislature for assistance with the building. I believe at that time no money had ever been given by the State to a hospital not under State control, but during a whole winter we met once or twice a week, usually at 10 P.M., districted the State of Pennsylvania, searched out in each district the medical alumni of the University, made out as far as possible who were the medical attendants of each Legislator, and then by personal letters applied to our professional brethren, almost always with quick and sure response, and so we obtained our appropriation. At last the lot, the building, and the first endowment were obtained, and to the medical profession the University Hospital owes its existence and the possibility of its ever-expanding life.

The University Hospital spends at least $75,000 a year above all moneys which it obtains from pay patients. This sum is in verity a payment for the clinical material which under our present medical curriculum is essential for the teaching during the third and fourth years of the course. If to this money be added the interest of three-quarters of a million of dollars, an under-valuation of the plant of the University Hospital, and our annual medical class of students be estimated at 125, the cost of clinical material for each individual student is for each of the last two years of his course about $500. It is in providing for this expenditure that the medical profession has done its work. Assuredly, however, the time has come when, at least temporarily, the medical profession should change the direction of its efforts. The deep undermoan of human suffering fills the world always with the sound of its pleadings, and when a hospital has reached the wealth of popularity and achievement that has come to the University Hospital its never-silenced cry for greater powers for service will always find altruistic ears to listen. For of such is the ever-multiplying harvest from the work of the great Galilean Master, at once the result and the seal of His divine teachings. The duty of the medical profession at the present moment is to make the world understand that as the laboratory underlies medical teaching so does it underlie the art as well as the science of medicine; and that to endow hospitals and to forget laboratories is to prune and train the upper branches of that tree of knowledge which is for the healing of the people, and to forget to keep alive the root which is the source of all-continuing development and growth.

THE AMERICAN MEDICAL ASSOCIATION.

The fifty-fifth annual meeting of the American Medical Association, held at Atlantic City, N. J., June 7 to 10, 1904, will long be remembered as one of the most successful in the history of that Association. From the point of view of the pharmacist this meeting was of more than ordinary interest on account of the inauguration of the innovation provided for at the meeting in New Orleans last year, admitting pharmaceutical members to the Section on Materia Medica, Pharmacy and Therapeutics.

While it is true that the number of these members admitted at this meeting was limited, the necessary precedent has been established, and it may reasonably be expected that with the added safeguards, provided for by the section, at future annual meetings the number of pharmaceutical members will be materially increased.

The working by-law, relating to pharmaceutical members, adopted at this meeting, provides that any pharmacist desiring to join the Section on Materia Medica, Pharmacy and Therapeutics of the American Medical Association must secure the endorsement of the local County Medical Society at least three months before the date of the annual meeting of the American Medical Association.

This endorsement with the necessary application is then to be forwarded to the Executive Committee of the Section on Materia Medica, Pharmacy and Therapeutics, who in turn will present the name to the members of the section for election.

This by-law places the responsibility for efficiency and probity of each individual member with the local society, and it is hoped that in this way it will be possible to prevent the admission of individuals who would be likely to use any possible advantage that membership in the American Medical Association would give them for commercial purposes.

For the pharmacists who were present as members, guests or delegates the meetings of the Section on Materia Medica, Pharmacy and Therapeutics were, of course, of greatest interest. Under the very able chairman, Dr. O. T. Osborne, Professor of Materia Medica and Therapeutics at the Yale Medical School, this section was able to present a programme containing no less than thirty-three papers.

The initial meeting, Tuesday, June 7th, consisted practically of a symposium on the abuses arising from the use of secret nostrums

and proprietary medicines. All of the communications, with the possible exception of the one on the coming edition of the United States Pharmacopœia, by Prof. Joseph P. Remington, were largely devoted to this particular problem.

The chairman, Dr. Osborne, in his address pointed out some of the possible dangers, to public health and morals, of the rapidly increasing nostrums and irregular practitioners.

The chairman's address was followed by the reading of the report of the committee on proprietary medicines. This report, in the absence of the chairman of the committee, Dr. Harry H. Moody, was read by the secretary, Dr. C. S. N. Hallberg, and was a conservative and a highly important communication. The committee point out that the indiscriminate condemnation of all proprietary preparations is not alone unjust but also tends to defeat or, at least, delay any necessary improvement or reform. They recommend that the American Medical Association have in view the gradual elimination of objectionable advertisements of medicinal preparations from the advertising pages of medical journals, particularly the *Journal of the American Medical Association*. With this object in view, the committee enumerate some of the most objectionable features of these preparations, and suggest changes that would be necessary to bring others within the limits of strictly legitimate preparations.

The plan as outlined would appear to be reasonable, and if carefully put into operation would be of incalculable benefit to the practice of medicine as well as pharmacy.

"Federal Supervision of Drugs" was the title of a very interesting communication by Dr. Harvey W. Wiley, the Chief Chemist of the Bureau of Chemistry, Department of Agriculture, in which he described the work that is being done at the present time by the Department of Agriculture as well as by the inspectors of the Department of the Treasury to prevent the importation and sale of adulterated drugs and food products. He also referred to the efforts that are being made by the Postmaster General to prevent the transmission in the mails of fraudulent and obnoxious preparations or advertisements. Dr. Wiley thinks that if the Postmaster General receives the hearty support of the members of the medical profession in his campaign against concerns doing a fraudulent business the latter would soon be exterminated, as they cannot flourish or

even exist without the wide publicity that is secured to them by the free use of the mails.

"The Eighth Decennial Revision of the Pharmacopœia of the U. S. A." was the subject of a paper presented by the chairman of the Revision Committee, Prof. Joseph P. Remington, who said that the new Pharmacopœia would probably appear in October. He spoke at some length of some of the advantages that are expected to accrue from the adoption of the recommendations of the International Conference for the unification of the formulæ of potent medicaments, and called attention to the fact that after the adoption of the new Pharmacopœia a number of the tinctures of potent drugs will be materially reduced in strength.

Tincture of aconite, for instance, instead of being 35 per cent. strength, will, with all of the other potent tinctures, have the uniform strength of 10 per cent.

The use of synonyms will be discouraged by placing them in the index but not in the body of the book. Average doses will be given. A number of the more widely used synthetic chemicals will be admitted under descriptive or definite chemical names.

"The Relation of the Physician to Proprietary Remedies" was the title of a paper presented by Dr. William J. Robinson, of New York. In this paper the writer divides physicians into three groups. The members of the first, or group A, prescribe anything that comes to their knowledge, while the members of group B are ultra-conservative, and never use proprietary medicines under any conditions. The members of class C, on the other hand, will carefully inquire into the character of new drugs and preparations and, if satisfactory, give them a fair trial.

Robinson differentiates between nostrums of secret composition and new remedies for which a patent has been granted, or is obtainable, and believes that the use of the latter is perfectly justifiable.

The discussion on these papers, collectively, was quite general, and certainly spirited. The general trend of the discussion, however, appeared to be that the practical instructions in materia medica and pharmacy as given in by far the greater number of medical colleges was inefficient, and that this lack of training, combined with the prominence given the claims of proprietary medicines in the advertising pages of medical journals, was largely responsible for the widespread use of this class of medicinal preparations.

The remaining papers were, with some notable exceptions, largely devoted to questions of therapeutics. One of the more interesting of the exceptional papers was on *Apocynum Cannabinum.* This was an analytical study of the physiological action of preparations of this drug, by Horatio C. Wood, Jr.

Dr. Wood finds apocynum to have a stimulating influence on the circulation, acting very much as does digitalis. It causes a slowing of the pulse, a rise of blood pressure and, like digitalis, arrests the frog heart in systole.

To give a full account of the scientific meetings would be practically impossible, as the programme alone consisted of a very respectable volume of more than 140 pages. The twelve sections into which the Association is divided, together with the general meetings, had offered to them upwards of 400 scientific communications. The papers presented at the several section meetings were not alone numerous but were also much above the average in quality of contents. The most encouraging feature, however, of the scientific meetings was the marked interest that was displayed by the members attending them. This interest evidenced the earnestness and sincerity of the members to improve themselves by absorbing such information as was offered them, and also to contribute in return any experiences and ideas that in their opinion might, or would, be of interest and value to their fellow practitioners.

The total attendance was the largest in the history of the Association, the (2,890) registration exceeding the highest previous attendance by fully 40 per cent.

No little of the credit for the success of this meeting is due to the local Committee of Arrangements, who were responsible not alone for the selection of the various meeting-places, but who also arranged and successfully carried out a most elaborate programme of social events, and in this way occupied every moment of time from the arrival of the members on Tuesday to their leaving, on the special train, on Friday afternoon to attend the dedication of the new Medical Laboratories at the University of Pennsylvania in Philadelphia.

The newly elected president of the American Medical Association is Dr. Lewis S. McMurtry, of Louisville, Ky., and the next meeting will be held in Portland, Ore., in connection with the Lewis & Clark Exhibition to be held there next year.

The officers of the Section on Materia Medica, Pharmacy and Therapeutics for 1904–1905 are: Heinrich Stern, New York, chairman; William J. Robinson, New York, vice-chairman; C. S. N. Hallberg, Chicago, secretary; J. W. Foss, Phenix, Ariz., delegate.

M. I. W.

OBITUARIES.

WILLIAM HENRY WEBB, M.D., was born on the 16th day of January, 1835, in Philadelphia, where he spent all his early life. At the commencement of the Civil War he was in the drug business with his cousin, Mr. John E. Grove, on Vine Street, below Thirteenth, and belonged to a company of Home Guards called "The Keystone Artillery." Early in 1862 he went to Washington, where he received an appointment as Chief Druggist at the Armory Square Hospital. Here he made the acquaintance of and became very intimate with the celebrated surgeon, Dr. Bliss, who was then in charge of the hospital. He was located here for some time, ranking as Hospital Steward, but on the completion of the Government Laboratory in Philadelphia, he was transferred to it by the department as an assistant to Chief Chemist Maisch.

In 1866, he took his degree from the Jefferson Medical College; his thesis on typhoid fever being considered very remarkable on account of its containing some original discoveries made by him relating to the disease. After graduation he had a quizz class at the college and was an assistant in clinic to Dr. DaCosta and others, among whom was the celebrated surgeon, Dr. Gross.

He also graduated from the Army and Navy College and the College of Pharmacy in 1868, becoming a member of the latter in the same year. Dr. Webb was also a member of the College of Physicians and of Post 2, Grand Army of the Republic, of which he was surgeon for twenty-three years. For some years he was medical examiner for the New England Mutual Life Insurance Company and the John Hancock Life Insurance Company. He belonged to Franklin Lodge, No. 134, F. and A. M.; Corinthian Chasseur Commandery, No. 53, Knights Templar, and the Lulu Temple, Ancient Arabic Order of the Nobles of the Mystic Shrine.

He was in practice in the northern section of the city since 1868, and at No. 556 North Sixteenth Street since 1880. He died December 20, 1903.

C. A. WEIDEMANN.

FRANK LUERSSEN.—Mr. Luerssen was born in Philadelphia on March 22, 1861, and spent practically all of his life there until he graduated from the Philadelphia College of Pharmacy.

During his lifetime he had managed pharmacies in New York and Washington. At one time he was in charge of Llewellyn's pharmacy, at Broad and Chestnut Streets, Philadelphia.

On April 19, 1893, he was married to Mrs. Aurelia Schaeffer, of Salem, New Jersey, and shortly thereafter established a pharmacy in the city of Salem, which he carried on with success until about one year prior to his death, when failing health made it necessary for him to retire from active business. He died on January 6, 1904.

Mr. J. W. Acton, Esq., of Salem, adds: "In submitting this brief outline of Mr. Luerssen's career, I feel an impulse to add that he was much esteemed here for his gentleness and kindness of heart, and his unostentatious generosity. He had great pride in his profession and exhibited great zeal in his efforts to establish here a pharmacy that would be more than a 'country drug store,' and compare favorably with those of larger cities. He was public-spirited and took an earnest interest in the permanent betterment of our little city. At all times he stood for improvement and municipal progress."

C. A. W.

WILLIAM M. CANBY.—By the death of William M. Canby lovers of botany have lost a comrade, and the world has been deprived of the presence of one of nature's noblemen—a man who was almost unceasing in his efforts to give to others a part of what he had learned, and who, endowed as he was with the gift of genius, largely enriched our knowledge of plant life.

To those not familiar with botanical work Mr. Canby's abilities in this field of study were little known, his innate modesty preventing him from accepting degrees from colleges, who would have been only too glad to bestow honor upon him.

In his home city, Wilmington, Del., it may safely be said that many did not know there lived among them a man to whom they were indebted for their beautiful parks—a man who kept in touch with and was so much loved and appreciated by the leading botanists of the world.

His love for botany began early in life, and, being an enthusiastic collector, he in 1858 began a systematic collection which, augmented by exchanges and purchases, resulted, some forty years later, in an

herbarium of more than 30,000 specimens, purchased by and now in the possession of the New York College of Pharmacy. A second collection, some 15,000 specimens, he presented to the Natural History Society of Wilmington, Del., who naturally treasure it in memory of one of the most genial and beloved of men.

To have known William M. Canby was to love him. He was always ready to impart his knowledge of botany and give advice even in matters of business, to which he was no stranger, having been identified with the Baltimore and Ohio Railroad as a director; a director in several banking concerns, and for twenty-four years President of the Wilmington Saving Fund—the strongest institution of its kind in the State of Delaware.

There is now a movement on foot to erect a substantial memorial of him, which will be placed in the beautiful Brandywine Park, that he so much loved and to which he devoted a great part of his energy and ability in beautifying.

The following has been issued by the Canby Memorial Fund Committee:

Many of the friends of the late William M. Canby, in recognition of the eminent service he rendered to the scientific world as a botanist, and to the city of Wilmington as President of the Park Commission, have thought it fitting and appropriate to erect a simple, plain, but suitable memorial to him in the Brandywine Park.

The Park Commission having given its consent to such a memorial, also added its approval by appointing a committee consisting of W. D. Bush, John M. Rogers and J. Newlin Gawthorp, who, with the Hon. William C. Spruance, Justice of the Supreme Court of Delaware; Prof. C. S. Sargent, of Harvard University, and the Rev. W. F. D. Lewis, minister of the Rodney Street Church, have decided upon a suitable site for such a memorial.

The site selected lies on a cliff overlooking the third dam on the park driveway between Franklin and Broome Streets.

The nature of the memorial will not be decided upon until all those who knew and appreciated the work of the late William M. Canby have had the opportunity of contributing.

Contributious may be sent to the Rev. W. F. D. Lewis, 1314 West Tenth Street, Wilmington, Del., who will act as treasurer of the fund, which will be placed in bank until the sum necessary for such an appropriate memorial is raised. J. S. BEETEM.

NOTES AND NEWS.

A BRONZE STATUE OF DR. BENJAMIN RUSH was unveiled in Washington on June 11th. It was given to the nation by the American Medical Association, and Prof. J. H. Musser, of Philadelphia, President of the Association, made the presentation address. It was accepted on behalf of the Government by President Roosevelt. The statue is of heroic size and stands on the grounds of the U. S. Naval Museum.

College House of the Philadelphia College of Pharmacy.

COLLEGE HOUSE OF THE PHILADELPHIA COLLEGE OF PHARMACY.—In the November issue of this JOURNAL attention was called to the establishment of a house for the use of the students of this College. Results have shown that this undertaking was a wise one, not only in furnishing the students with comfortable and healthful surroundings, but also in promoting fraternal relations among them.

This year the College House Association has, by the aid of Mr. William Weightman, of the firm of Powers & Weightman, secured control of a finely

equipped apartment house, fitted with all modern conveniences, bathrooms, steam heaters, parlor, reception-room, toilet-rooms, dining-rooms, and accommodations for sixty students.

The house is situated at 112 North Eighteenth Street, and is everything that can be desired, with an open outlook in the rear. Plenty of ventilation is provided. A nominal board is charged each student, which is less than poor accommodations elsewhere would cost.

Present and prospective students should communicate at once with E. Fullerton Cook, P.D., 145 N. Tenth Street, Philadelphia. The house is under the control of a Board of Governors, which is composed as follows: Mahlon N. Kline, Chairman; Prof. Joseph P. Remington, Howard B. French, W. A. Rumsey, Prof. S. P. Sadtler, Henry C. Blair, Jacob Baer, James T. Shinn and E. Fullerton Cook.

HOWARD B. FRENCH, President of the Philadelphia College of Pharmacy, gave an informal dinner to the Faculty and members of the Board of Trustees, at his summer residence, "Alderbrook," near Valley Forge, on Wednesday, June 22d. The ride from the station to Mr. French's home is through a beautiful section of country, which is especially attractive at this season, with the roses in full bloom and ripe cherries loading the trees. Mr. French's grounds are extensive, including a large lawn and a wooded area, both of which are in excellent condition. The occasion furnished an opportunity for the members to meet together socially, and was highly enjoyed by all.

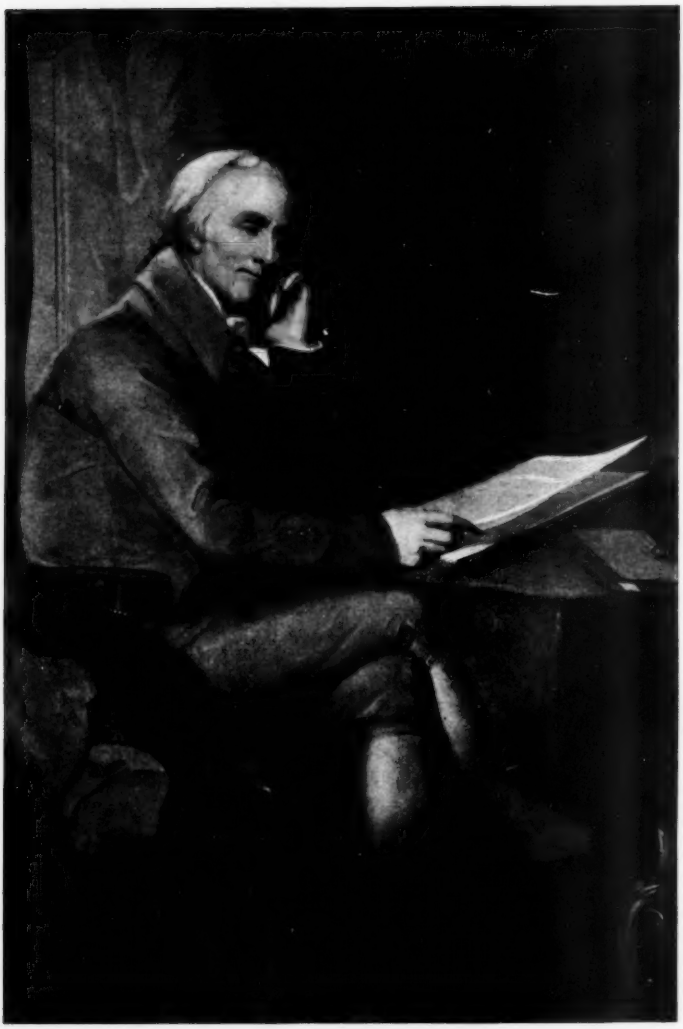
PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.—The annual meeting was held at Cambridge Springs, Crawford County, June 21st, 22d and 23d, the Hotel Rider being the headquarters of the Association. A full account of the meeting will be published in our next issue.

MILK IN TYPHOID FEVER is the title of an illustrated pamphlet recently published by the Smith, Kline & French Company. The color illustrations, showing the actual condition of the intestinal surfaces during the different stages of typhoid fever, are well reproduced, and are from Kast and Rumpel's classical work. The paper is devoted to a discussion of the use of cereal decoctions in modifying the defects of a milk diet alone in typhoid fever.

COMMERCIAL CATALOGUES.—In a plea for a bibliography of the documents pertaining to American pharmaceutical history Edward Kremers (*Bulletin of Pharmacy*, June, 1904) says: "In such a bibliography catalogues of manufacturers and jobbers will and should occupy a conspicuous place. Each existing manufacturing and jobbing firm should regard it a matter of pride to collect a complete set of its own catalogues, price-lists, and even leaflets, if possible, and present them to the American Pharmaceutical Association. The sooner this is done the better."

AMERICA'S FIRST CUTTER.—M. I. Wilbert (*Ibid.*) gives a sketch of T. W. Dyott, who, during the early part of the nineteenth century, conducted what was probably the first cut-rate drug store in this country, his establishment being at Second and Race Streets, in Philadelphia.

MASSACHUSETTS COLLEGE OF PHARMACY.—Prof. Wilbur L. Scoville has resigned the professorship of pharmacy in this institution, and has accepted a position with a large Boston drug firm. Prof. E. H. La Pierre has been chosen his successor.



DR. BENJAMIN RUSH

(1745–1813).

From "The History of Medicine in the United States," by Francis R. Packard, M.D.